

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 97-069

ADOPTION OF SITE CLEANUP REQUIREMENTS FOR:

**CATELLUS DEVELOPMENT CORPORATION
EMERYVILLE CRESCENT (PROPOSED EASTSHORE PARK) PROPERTY
OAKLAND AND EMERYVILLE
ALAMEDA COUNTY**

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

1. **Site Location:** The site includes about 8.5 acres of uplands and 499 acres of non-uplands (tidelands and submerged lands) along the Oakland and Emeryville shoreline. It is bounded by Interstate 80 to the east and south, and Powell street to the north (see attached map). The site has no street address and is identified as Alameda County Assessor's Parcel Numbers 049-1516-003-04, 1520-002, 1521-003-01, 0000-0300-002, 003. The site fronts on San Francisco Bay Central and is crossed by three major stormwater channels. The site is vacant but is adjacent to major roadways (Interstate 80 and Powell Street) and the land use on the opposite side of these roadways is industrial/commercial.
2. **Site History:** The uplands area at the site was created by filling of marshlands west of the Southern Pacific Railroad tracks. The southern portion of the site appears to have been filled by 1949; however, filling at the eastern edge of the site appears to have continued into the 1950's. The northern portion of the site was reportedly filled sometime between World War II and the mid-1960's. The fill material used at the northern portion of the site consists of rubble and debris from building demolition, steel mill slag, industrial waste, and sand and clay fill. The potential pollutants associated with such fill material are inorganics (such as lead, zinc, and arsenic), polychlorobiphenyls (PCBs), volatile and semi-volatile organics, and petroleum hydrocarbons.

SF Pacific Property, Inc., is the property owner and is a wholly owned subsidiary of Catellus Development Corporation (Catellus). Catellus was previously known as Santa Fe Pacific Realty Corporation. Catellus and its predecessors have owned and managed the site for over 50 years.
3. **Anticipated Park Use:** The site is one of the parcels in a proposed land transaction between Catellus and the California Department of Parks and Recreation (DPR) and the East Bay Regional Park District (District). This site, along with other shoreline properties in Berkeley, Albany, and Richmond, would be acquired by DPR and the District for use as a State park facility in order to preserve their significant habitat

value and complete the East Bay Shoreline Trail and Park. This acquisition transaction is the immediate reason for this Order, as the parties to the transaction intend that necessary remediation be completed prior to the transfer of the properties to the public.

The Board has been designated as the lead agency for environmental oversight by Cal/EPA pursuant to A.B. 2061.

4. **Named Dischargers:** Catellus Development Corporation is named as a discharger because it wholly owns SF Pacific Property, Inc. (the current property owner) and because its predecessors owned and managed the property when waste was placed on or released to the site. If additional information is submitted indicating that other parties caused or permitted any waste to be discharged on the site where it entered or could have entered waters of the state, the Board will consider adding that party's name to this order.
5. **Regulatory Status:** This site is currently not subject to Board order.
6. **Site Characteristics:** Approximately ninety percent of the site is intertidal and submerged land (non-uplands). The upland portion of the site is a narrow strip of land, parallel to the north, east and south site boundaries, that forms a crescent shape. The east and south sides of the crescent are predominantly tidal flats which slope up toward Interstate 80 and rise to approximately 5 feet above MSL. The northern portion of the crescent rises steeply from the submerged portion to approximately 10 feet above MSL along Powell Street. The non-uplands at the site are known to be in a depositional environment, in that there is a net increase in sediment levels over time.

The thickness of the upland fill material ranges typically from 5 to 10 feet, however, it may be as much as 20 feet at some portions of the site. Brick, metal slag, wood, asphalt, tar paper, glass and charcoal fragments have been observed within the fill material unit in the subsurface soils at the site. The Bay Mud encountered below the fill material is described as a gravelly silty clay. Shallow groundwater is encountered at sea level in the tidal flats and at 5 to 10 feet below ground surface (bgs) in the upland areas. Groundwater elevations at the site are tidally influenced and the regional groundwater flow direction is west to southwest toward the Bay. The shallow groundwater beneath the site is generally brackish, given its proximity to the Bay, with total dissolved solids (TDS) levels as high as 44,000 mg/l.

The five general habitat types identified at the site are open water, subtidal benthos, tidal mudflat, intertidal marsh, and upland. These habitats are a significant portion of the overall habitat that is available to estuary wildlife on the east shoreline of the San Francisco Bay Central. The open water and subtidal benthos communities include a variety of fish and invertebrate species that support resident water birds, such as cormorants and terns. The tidal mudflats at the site are important to migratory shorebirds and water fowl, which feed on the abundant and diverse invertebrates in the sediments. The intertidal marsh supports a variety of invertebrates, bivalves, fish,

birds, and mammals that are rarely found in other habitat types. Many endangered and threatened species in the San Francisco Bay region are associated with intertidal salt marshes. The uplands at the site are generally dominated by non-native plants. Several opportunistic birds and mammals currently utilize these areas, which have a high potential for habitat restoration or enhancement.

7. **Remedial Investigation:** The following eight documents, which describe the soil and groundwater investigations conducted at the site, have been submitted to the Board:

July 1989, *Environmental Site Assessment, The Emeryville Crescent Property-Emeryville, California*, prepared by Levine-Fricke for Catellus

October 1993, *Phase I Environmental Site Assessment for Emeryville Crescent-Emeryville, California*, prepared by Tetra-Tech for the District

October 1993, *Data Gap Investigation Report-Eastern and Southern Site Area-Emeryville Crescent Property, Emeryville/Oakland, California*, prepared by Tetra-Tech for the District

October 1993, *Subsurface Investigation, Northern Site Area, Emeryville Crescent Property, Emeryville/Oakland, California*, prepared by Tetra-Tech for the District

October 1994, *Slag Characterization Investigation, Northern Portion, Emeryville Crescent Property, Emeryville and Oakland, California*, prepared by Tetra-Tech for the District

June 1995, *Draft Summary Report, Hydrocarbon Investigation, Northern Site Area, Emeryville Crescent Property, Emeryville, California*, prepared by Tetra-Tech for the District

January 1996, *Draft Remediation Plan, Emeryville Crescent Property, Emeryville/Oakland, California*, prepared by ERM/West for Catellus

January 1997, *Revised Environmental Assessment, Eastshore Properties*, prepared by ERM/West for Catellus

The above documents provide the information summarized below.

- a. **Upland soils:** Approximately 100 soil samples were collected at different depths in the uplands area at the site (area above the line of highest tidal action). The samples are broadly classified as surface /near-surface samples (0 to 2 feet bgs) and subsurface samples (2 to 10 feet bgs). The principal constituents of concern are inorganics (lead, zinc, arsenic, cadmium, copper, and mercury), PCBs, and total petroleum hydrocarbons in the diesel range (TPH-d). The maximum concentrations of metals detected in the upland areas are 9,210 ppm for lead, 63,000 ppm for zinc, 39 ppm for arsenic, and 6.6 ppm for mercury. The maximum concentrations of PCBs and TPH-d detected in the upland areas are 2.45 ppm and 890 ppm respectively. Maximum concentrations are not representative of average site conditions.

- b. **Upland groundwater:** Approximately 25 shallow groundwater grab samples were collected from soil borings drilled at the site. The principal constituents of concern in groundwater are metals (such as chromium and zinc) and total petroleum hydrocarbons in the diesel range. The maximum concentrations of chromium, zinc, and TPH-d detected in filtered groundwater samples are 200 ppb, 2,300 ppb, and 5,000 ppb, respectively. Maximum concentrations are not representative of average site conditions. In general, these pollutant concentrations do not warrant remediation, for several reasons: shallow groundwater is too brackish to qualify as a potential source of drinking water, elevated concentrations are located more than 50 feet from the shoreline, metals and TPH-d are not particularly mobile in shallow groundwater, and migration potential will be further reduced by soil remediation proposed for soils overlying these locations. At one sampling location (EC-B-9), TPH-d concentrations are sufficiently high to pose a potential threat to beneficial uses in non-uplands.
- c. **Non-upland sediment:** Approximately 21 non-upland sediment samples were collected at the surface/ near-surface depth ranging from 0 to 2 feet bgs. The principal constituents of concern in the non-upland sediment are metals (such as lead, zinc, arsenic, cadmium, copper, and mercury), PCBs, and total petroleum hydrocarbons in the diesel range (TPH-d). The maximum concentrations of metals detected in the non-upland sediment are 518 ppm for lead, 1,640 ppm for zinc, 38.5 ppm for arsenic, 9.7 ppm for cadmium, and 6.6 ppm for mercury. The maximum concentrations of PCBs and TPH-d detected in the non-upland sediment are 0.8 ppm and 3,500 ppm, respectively. Maximum concentrations are not representative of average site conditions.
- d. **Nexus for non-upland pollution:** To determine if any of the non-upland sediment pollution has originated from pollution in the upland areas, i.e. to show "nexus" between the upland and sediment pollution, the Board used the following three step approach. First, identify "hot spots" in the upland areas where soil sampling has indicated presence of chemical constituents substantially in excess of NOAA's Effects Range Median (ERM) levels. Second, determine if the exceedances over ERM levels for the same constituents extend down to the shoreline. Third, determine if the sediment concentrations near the upland "hot spots" are elevated in comparison with other sediment samples at the site. Based on this three- step approach no "nexus" was found between upland and non-upland pollution at the site.

However, there are pollutant levels in sediment at the site that are above the ERM levels. The potential sources for these elevated levels of pollutants in the sediment include illegal dumping, polluted upland fill (onsite and offsite), stormdrain discharges into the Bay and sediments, storm water runoff from lands and roadways adjacent to the site, and atmospheric deposition from non-

point sources such as automobile exhaust. The Board may, in future, address the elevated sediment pollution at the site through a watershed management approach that would consider the previously mentioned pollution sources. This may result in current and/or future property owners and possibly other parties being responsible for additional site remediation.

8. **Interim Remedial Measures:** No interim remedial measures have been implemented at the site. Remediation and/or risk-management measures need to be implemented at this site to reduce the threat to water quality, public health, and the environment posed by existing conditions.
9. **Risk Assessment:** Catellus provided a risk assessment in its January 1997 Revised Environmental Assessment of East Shore Properties. The risk assessment considered both human health risk and ecological risk. It is appropriate for the risk assessment to consider a range of recreational uses, given that park master planning will not commence until after the property transfer.
 - a. **Human Health Assessment:** Catellus initially proposed to use USEPA Region 9 preliminary remedial goals for industrial land use (industrial PRGs) to determine if pollutants in upland soils pose a threat to human health. Industrial PRGs may not adequately protect human health in a regional park setting, given that they do not consider child exposure. A more appropriate human health screening value is one based on USEPA Region 9 residential PRGs, adjusted for lower exposure durations typical of regional parks (regional park PRG). Upland soils at the site exceed a regional park PRG for some metals at two locations near Powell Street, on the northern portion of the site.
 - b. **Ecological Risk Assessment:** Catellus initially proposed to use interim remediation criteria developed by the Canadian Council of Ministers for the Environment for agricultural land use (IRCs) to determine if pollutants in upland soils pose a threat to ecological receptors. IRCs may not adequately protect ecological receptors, for at least two reasons: they focus on human receptors consuming agricultural products and they focus solely on terrestrial species. A more appropriate ecological screening process is one that targets both terrestrial and wetland/marine species. Relevant screening values include: preliminary screening goals developed at DOE's Oak Ridge National Laboratory (all species, mouse, and woodcock) and NOAA's sediment screening factors (ERMs and ERLs). The former apply to upland areas, and the latter apply to upland areas near the shoreline (a 50-foot wide upland buffer) and to non-uplands.

Upland soils at the site exceed DOE/mouse screening values at the same two locations near Powell Street; the exceedance areas are somewhat larger,

however. Upland buffer soils and non-upland sediments at the site exceed the NOAA/ERM screening value at several locations.

- c. **Risk Management:** It is appropriate to apply the more stringent of human health and ecological screening values at this site to assure that both recreational users and ecological receptors are protected. Where significant exceedances of screening values occur, remediation or risk management or a combination of the two are necessary.

- 10. **Remediation Plan:** Catellus submitted a *Draft Remediation Plan, Emeryville Crescent Property, Emeryville/Oakland, California* report, dated January 25, 1996, for remediation of the upland areas at the site. The draft remediation plan considered four alternatives based on human health considerations. The four alternatives were 1) no action, 2) surface protective capping, 3) soil washing, and 4) selective excavation and land disposal. The four alternatives were evaluated using factors such as overall protection of human health and the environment, duration and ease of implementation, cost analysis, and proposed future land use (public park). Based on the evaluation, the proposed alternative was 'selective excavation and land disposal'. The proposed alternative would involve excavation, removal, and off-site disposal of metal-impacted soils in portions of the upland area adjacent to Powell Street in the northern portion of the site. Clean soil would be imported to backfill and cap the excavated areas. Based on the anticipated future land use, the remediation plan generally discussed actions that would limit risks to human health such as capping by construction of nature trails or viewing platforms, or limiting human activity at the southern and eastern portions of the site.

The draft remediation plan considered only those locations in the upland areas where the lead and zinc concentrations in soil were in excess of 1,000 ppm and 5,000 ppm, respectively. However, there are other locations in the upland areas at the site, as identified in finding 7 above, that warrant remediation or risk management based on human health and ecological considerations. Further, the remediation plan did not specify future risk management measures to be implemented at the site. Therefore, the draft remediation plan needs to be revised to include additional remediation and/or site specific risk management measures.

The draft remediation plan proposes no remediation or risk management for shallow groundwater at the site. However, TPH-d concentrations at one sampling location (EC-B-9) pose a potential threat to beneficial uses in adjacent non-uplands. The draft remediation plan needs to be revised to address this potential threat.

- 11. **Basis for Remediation Standards**

- a. **General:** State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge

and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Remediation levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in exceedance of applicable water quality objectives. Remediation standards established herein are above background levels but meet the above tests.

State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

- b. **Beneficial Uses:** The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23 CCR 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the site is not a potential source of drinking water due to naturally high TDS.

The potential beneficial uses of groundwater underlying the site include: freshwater replenishment to surface waters.

The existing and potential beneficial uses of San Francisco Bay Central include:

- . Ocean, commercial, and sport fishing
- . Estuarine habitat
- . Industrial service supply
- . Navigation
- . Industrial process supply
- . Preservation of rare and endangered species
- . Water contact and non-contact recreation
- . Shellfish harvesting
- . Fish migration and spawning

- c. **Basis for Soil Remediation Standards:** Due to the limited time available for oversight, screening values are used directly as soil remediation standards. In upland areas, soil remediation standards will be the lower of the regional park PRGs and DOE/mouse but not less than background soil concentrations. In upland buffer areas, an additional screening value - NOAA/ERMs - should apply, to protect adjacent non-uplands from erosion of polluted upland soils. Attainment of these standards will reasonably protect human health and the environment.
12. **Future Changes to Remediation Standards:** The goal of this remedial action is to restore the beneficial uses of the site. If full restoration of beneficial uses is not technologically nor economically achievable within a reasonable period of time, then the discharger may request modification to the remediation standards.
13. **Basis for 13304 Order:** The discharger has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.
14. **Cost Recovery:** Pursuant to California Water Code Section 13304, the discharger is hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.
15. **CEQA:** This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.
16. **Notification:** The Board has notified the discharger and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.
17. **Public Hearing:** The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger (or its agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.
2. Further significant migration of wastes or hazardous substances through surface or subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and remediation which will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. REMEDIATION PLAN AND STANDARDS

1. **Implement Remediation Plan:** The discharger shall implement the remediation plan described in finding 10 and as modified pursuant to task 1 below.
2. **Soil Remediation Standards:** Soil remediation standards in Table 1 shall be met in all upland soils located 0 to 2 feet below ground surface in accordance with the remedial action plan addendum (see task 1).

C. TASKS

1. ADDENDUM TO REMEDIAL ACTION PLAN

COMPLIANCE DATE: August 1, 1997

Submit a technical report acceptable to the Executive Officer containing a revised proposal for remediation and risk management based on the soil remediation standards in this order. The report should identify specific tasks and schedule for implementing proposed remediation and risk management measures, including a proposed completion deadline. The risk management portion of the report should include at least the following elements:

- a. Mapping of areas where risk management measures needed for higher-intensity recreational activities
- b. Identification of risk management options for typical higher-intensity recreational activities (e.g. picnic areas, tot-lots, playing fields)

- c. Identification of risk management measures needed adjacent to higher-intensity recreational activities (e.g. vegetation to prevent transport of dust-borne constituents to down-wind areas)
- d. Identification of risk management measures needed in the upland buffer (e.g. erosion control measures to prevent transport of constituents in runoff)

The report should propose measures to address TPH-d pollution in shallow groundwater at one sampling location (EC-B-9) and its potential threat to beneficial uses in adjacent non-uplands. Options include: additional source controls in overlying soils to remove sufficient TPH-d pollutant mass to protect such beneficial uses in down-gradient non-uplands, additional groundwater investigation to document attenuation toward the shoreline, or groundwater monitoring after shallow soil remediation to verify stable or declining groundwater concentrations.

2. IMPLEMENTATION OF REMEDIAL ACTIONS

COMPLIANCE DATE: Deadline proposed in task 1 addendum and approved by Executive Officer

Submit a technical report acceptable to the Executive Officer documenting completion of remedial actions proposed in the remedial action plan as modified by the task 1 addendum.

- 3. **Delayed Compliance:** If the discharger is delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

D. PROVISIONS

- 1. **No Nuisance:** The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).
- 2. **Good Operation and Maintenance (O&M):** The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.
- 3. **Cost Recovery:** The discharger shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by

the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the discharger over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

4. **Access to Site and Records:** In accordance with California Water Code Section 13267(c), the discharger shall permit the Board or its authorized representative:
 - a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the requirements of this Order.
 - c. Inspection of any monitoring or remediation facilities installed in response to this Order.
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
5. **Self-Monitoring Program:** The discharger shall comply with the Self-Monitoring Program as may be established by the Executive Officer.
6. **Contractor / Consultant Qualifications:** All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.
7. **Lab Qualifications:** All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).

8. **Document Distribution:** Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies:
- a. City of Oakland
 - b. City of Emeryville
 - c. Alameda County - Department of Environmental Health
 - d. Cal/EPA - Department of Toxic Substances Control (Site Mitigation)

The Executive Officer may modify this distribution list as needed.

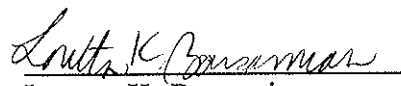
9. **Reporting of Changed Owner or Operator:** The discharger shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.
10. **Reporting of Hazardous Substance Release:** If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the discharger shall report such discharge to the Regional Board by calling (510) 286-1255 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services required pursuant to the Health and Safety Code.

11. **Periodic SCR Review:** The Board will review this Order periodically and may revise it when necessary. The discharger may request revisions and upon review the Executive Officer may recommend that the Board revise these requirements.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 21, 1997.


Loretta K. Barsamian
Executive Officer

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FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS ORDER MAY SUBJECT
YOU TO ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO:
IMPOSITION OF ADMINISTRATIVE CIVIL LIABILITY UNDER WATER CODE
SECTIONS 13268 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR
INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

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Attachments: Site Map
Soil Remediation Standards Table

2. Standard for protection of non-upland ecological receptors adjacent to 50-foot upland buffer, risk management required in areas exceeding standards (e.g. erosion control measures).
3. Key for basis:
 - Park: Human health protection based on modified residential PRG appropriate to recreational land use, remediation or appropriate risk management needed for upland soils that exceed this level
 - DOE/Mouse: Ecological protection based on DOE Oak Ridge National Laboratory ecological screening value for mouse, remediation or appropriate risk management needed for upland soils that exceed this level
 - Ambient: Background concentration of metals in soil (LBNL, August 1995)
 - BPJ: Best professional judgement, based on non-health factors (staining, odor)
 - SFIA: Ecological protection based on toxicity data developed for the San Francisco International Airport, erosion control measures needed for upland buffer soils that exceed this level
 - ERM: Ecological protection based on NOAA effects range median, erosion control measures needed for upland buffer soils that exceed this level
4. Ambient concentration is higher than regional park PRG of 4.5 mg/kg.
5. Ambient concentration is higher than DOE/mouse screening value of 40.4 mg/kg.

Catellus / Emeryville Crescent
Remediation Standards
Table 1 - Soil

Constituent of concern (by category)	Upland - including buffer ¹		Upland buffer only ²	
	Standard (mg/kg)	Basis ³	Standard (mg/kg)	Basis ³
Metals				
Arsenic	14	Ambient ⁴		
Cadmium	33	DOE/mouse	9.6	ERM
Chromium	91.4	Ambient ⁵		
Copper	415	DOE/mouse	270	ERM
Lead	840	Park PRG	218	ERM
Mercury	0.9	DOE/mouse	0.71	ERM
Molybdenum	16.4	DOE/mouse		
Zinc	1,140	DOE/mouse	410	ERM
PCBs				
Total PCBs	1.5	Park PRG	0.18	ERM
PCB - 1260	0.88	DOE/mouse		
Petroleum hydrocarbons				
TPHd	1,000	BPI	520	SFIA

Notes:

1. Standard for protection of human health and upland ecological receptors, remediation or risk management required in areas exceeding standards.

